

U.S. Department of Commerce, Patent and Trademark Office LIST OF RELEVANT ART CITED BY APPLICANT (Use several sheets if necessary)	Docket No.: 2287/C03/PVD/PS	Serial No.: unknown
	Applicant(s): Imran Hashim, Tony Chiang and Barry L. Chin	
	Filing Date: Herewith	Group:

U.S. Patent Documents

*Examiner Initial		Document Number	Issue Date	Name	Class	Subclass	Filing Date If Appropriate
CL	AA	4,756,810	07/12/88	Lamont, Jr. et al.			
CL	AB	4,816,126	03/28/89	Kamoshida et al.			
CL	AC	6,110,821	08/29/00	Kohara et al.			
CL	AD	6,291,885 B1	09/18/01	Cabral, Jr. et al.			
CL	AE	6,375,810 B2	04/23/02	Hong			
	AF						
	AG						
	AH						
	AI						
	AJ						
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Foreign Patent Documents

Translation

		Document Number	Date	Country	Class	Subclass	Yes	No
CL	AL	JP61261472A2	11/19/86	JP			X Abstract Only	
CL	AM	JP4030421A2	02/03/92	JP			X Abstract Only	
CL	AN	EP 0 202 572 B1	12/15/93	EP				
	AO							
	AP							

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

CL	AR	Fusen Chen et al., U.S. Patent Application No. 08/856,116, filed May 14, 1997, entitled "Reliability Barrier Integration for CU Application"
	AS	
	AT	

Examiner

calvinlee

Date Considered

6.16.04

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Foreign Patent Documents							Translation	
C	AF	5,262,354	11/16/93	Cote et al.	_____	_____		
	AG	5,376,584	12/27/94	Agarwala	_____	_____		
	AC	5,486,492	01/23/96	Yamamoto et al.	_____	_____		
	AH	5,585,673	12/17/96	Joshi et al.	_____	_____		
	AI	5,612,254	03/18/97	Mu et al.	_____	_____		
	AJ	5,693,563	12/02/97	Teong	_____	_____		
	AK	5,731,245	03/24/98	Joshi et al.	_____	_____		
	AD	5,744,376	04/28/98	Chan et al.	_____	_____		
	AE	5,759,906	07/1998	Lou	_____	_____		
	AA	5,904,565	05/18/99	Nguyen et al.	_____	_____		
CL	AB	5,933,753	08/03/99	Simon et al.	_____	_____		
		Document Number	Date	Country	Class	Subclass	Yes	No
CL	AL	0 798 778 A2	10/01/97	EP	_____	_____		
CL	AM	0 892 428 A2	01/20/99	EP	_____	_____		
CL	AN	0 788 160 A3	06/16/99	EP	_____	_____		
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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	"Endpoint Detection Method for Ion Etching of Material Having a Titanium Nitride Underlayer", RESEARCH DISCLOSURE, February 1991, Number 322, (C) Kenneth Mason Publications Ltd, England
CL	AS	Novellus Damascus Home Page, "12 Steps of Damascus"
	AT	

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U	AA	5,966,634	10/12/99	Inohara et al	2		
	AB						
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CL	AA	3,410,774	11/12/68 Barson et al.				
	AB	4,358,338	11/09/82 Downey et al.				
	AC	4,565,601	01/21/86 Kakehi et al.				
	AD	4,681,653	07/21/87 Purdes et al.				
	AE	4,732,761	03/22/88 Machida et al.				
	AF	4,756,801	07/12/88 Jokinen et al.				
	AG	4,767,496	08/30/88 Hieber				
	AH	4,793,895	12/27/88 Kaanta et al.				
	AI	4,810,335	03/07/89 Hieber				
	AJ	4,824,546	04/25/89 Ohmi				
CL	AK	4,865,712	09/12/89 Mintz				

Foreign Patent Documents							Translation	
Document Number	Date	Country	Class	Subclass	Yes	No		
CL AL 0 123 456 A2		EP						
CL AM 0 297 502 A2		EP						
CL AN 02134164		JP			Abstract Only			
CL AO 0 735 577 A2		EP						
CL AP 8213119A2		JP			Abstract Only			

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	H. Koenig et al., "RF Sputtering System with Variable Substrate Bias", July 1970, IBM Technical Disclosure Bulletin, Vol. 13, No. 2, pp. 323-324
CL	AS	L.J. Kochel, "Pressure Control of RF Bias for Sputtering", December 1976, Rev. Sci. Instrum., Vol. 47, No. 12, pp. 1556-1557
CL	AT	K. Suzuki et al., "Microwave Plasma Etching", November, 1997, Japanese Journal of Applied Physics, Vol. 16, No. 11, pp. 1979-1984

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CL	AA	4,874,493	Pan				
	AB	4,874,494	Ohmi				
	AC	4,891,112	Wong				
	AD	4,915,806	Lardon et al.				
	AE	4,962,060	Sliwa et al.				
	AF	4,963,239	Shimamura et al.				
	AG	4,968,374	Tsukada et al.				
	AH	4,999,096	Nihei				
	AI	5,069,770	Glocker				
	AJ	5,078,847	Grosman et al.				
CL	AK	5,124,014	Foo et al.				

Foreign Patent Documents							Translation	
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AL								
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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	H. Kotani et al., "Sputter-Etching Planarization for Multilevel Metallization", March 1983, J. Electrochem. Soc., Vol. 130, No. 3, pp. 645-648
CL	AS	K. Suzuki, "Microwave Plasma Etching", 1984, Central Research Laboratory, Hitachi Ltd., pp. 953-957
CL	AT	S. Matsuo, "Reactive Ion-Beam Etching and Plasma Deposition Techniques Using Electron cyclotron Resonance Plasmas", 1985, Aisugi Electrical Communication Laboratory, pp. 75-117

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CL	AA	5,126,028	Hurwitt et al.				
	AB	5,178,739	Barnes et al.				
	AC	5,221,640	Sato				
	AD	5,270,264	Andideh et al.				
	AE	5,271,972	Kwok et al.				
	AF	5,302,266	Grabarz et al.				
	AG	5,303,139	Mark				
	AH	5,308,793	Taguchi et al.				
	AI	5,346,600	Nieh et al.				
	AJ	5,350,479	Collins et al.				
CL	AK	5,354,712	Ho et al.				

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Document Number	Date	Country	Class	Subclass	Yes	No		
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AM								
AN								
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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	Homma et al., Planar Deposition of Aluminum by RF/DC Sputtering with RF Bias", June, 1985, J.Electrochem.Soc., Solid State Sci. & Tech., Vol. 132, No. 6, pp. 1466-1471
CL	AS	"SypherLine by MTi", November, 1985, Semiconductor International
CL	AT	H.P. Bader et al., "Planarization by Radio-Frequency Bias Sputtering of Aluminum as Studied Experimentally and by Computer Simulation", Nov./Dec. 1985, J.Vac.Sci.Technol.A3(6), pp. 2167-2171

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CL	AA	5,371,042	12/06/94 Ong				
	AB	5,482,611	01/09/96 Helmer et al.				
	AC	5,510,011	04/23/96 Okamura et al.				
	AD	5,512,150	04/30/96 Bourez et al.				
	AE	5,516,399	05/14/96 Balconi-Lamica et al.				
	AF	5,534,460	07/09/96 Tseng et al.				
	AG	5,584,974	12/17/96 Sellers				
	AH	5,585,974	12/17/96 Shrinkle				
	AI	5,589,041	12/31/96 Lantsman				
	AJ	5,591,269	01/07/97 Arami et al.				
CL	AK	5,613,296	03/25/97 Kurino et al.				

Foreign Patent Documents							Translation	
Document Number	Date	Country	Class	Subclass	Yes	No		
AL								
AM								
AN								
AO								
AP								

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	Technical Staff, MTI Thin Film Equipment Division, "Planarizing Enhancement Mode "Sputtering...Plus"(TM) for Planarized Aluminum in Sypherline(TM)", April, 1986, Applications Note, Vol. 1, No. 1
CL	AS	D.W. Skelly et al., "Significant Improvement in Step Coverage Using Bias Sputtered Aluminum", May/June, 1986, J.Vac.Sci.Technol. A4(3), pp. 457-460
CL	AT	M.Yamashita, "Fundamental Characteristics of Built-In High-Frequency Coil-Type Sputtering Apparatus", Mar./Apr. 1989, J.Vac.Sci.Technol.A, Vol. 7, No. 2, pp. 151-158

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	2287/C03/PVD/PS	unknown
	Applicants:	
	Imran Hashim, Tony Chiang and Barry L. Chin	
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	herewith	Unknown

U.S. Patent Documents							
*Examiner Initial		Document Number	Issue Date	Name	Class	Subclass	Filing Date If Appropriate
CL	AA	5,639,357	06/17/97	Xu			
	AB	5,651,865	07/29/97	Sellers			
	AC	5,654,232	08/05/97	Gardner			
	AD	5,674,787	10/07/97	Zhao et al.			
	AE	5,685,961	11/11/97	Pourrezaei et al.			
	AF	5,685,959	11/11/97	Bourez et al.			
	AG	5,718,813	02/17/98	Drummond et al.			
	AH	5,725,739	03/10/98	Hu			
	AI	5,770,023	06/23/98	Sellers			
	AJ	5,780,357	07/14/98	Xu et al.			
CL	AK	5,807,467	09/15/98	Givens et al.			

Foreign Patent Documents							Translation	
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	AL							
	AM							
	AN							
	AO							
	AP							

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	M. Matsuoka et al., "Dense Plasma Production and Film Deposition by New High-Rate Sputtering Using an Electric Mirror", July/Aug. 1989, J.Vac.Sci.Technol A7(4), pp. 2651-2657
CL	AS	P. Kidd, "A Magnetically Confined and Electron Cyclotron Resonance Heated Plasma Machine for Coating and Ion Surface Modification Use", May/June 1991, J.Vac.Sci.Technol.A., pp. 466-473
CL	AT	J. Musil, "Unbalanced Magnetrons and New Sputtering Systems with Enhanced Plasma Ionization", May/June 1991, J.Vac.Sci.Technol.A9(3), pp. 1171-1177

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U.S. Patent Documents							
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<i>CL</i>	AA	5,810,963	09/22/98 Tomioka				
	AB	5,810,982	09/22/98 Sellers				
	AC	5,846,332	12/08/98 Zhao et al.				
	AD	5,858,184	01/12/99 Fu et al.				
	AE	5,863,392	01/26/99 Drummond et al.				
	AF	5,865,961	02/02/99 Yokoyama et al.				
	AG	5,897,752	04/27/99 Hong et al.				
	AH	5,968,327	10/19/99 Kobayashi et al.				
	AI	5,976,327	11/02/99 Tanaka				
	AJ	5,985,762	11/16/99 Geffken et al.				
<i>CL</i>	AK	6,001,420	12/14/99 Mosely et al.				

Foreign Patent Documents							Translation	
Document Number	Date	Country	Class	Subclass	Yes	No		
AL								
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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
<i>CL</i>	AR	I. Ivanov, et al., "Electron Energy Distribution Function in a DC Magnetron Sputtering Discharge", 1992, Vacuum, Vol. 43, No. 8, pp. 837-842
<i>CL</i>	AS	C. Nender, "High Bias Sputtering for Large-Area Selective Deposition", 1993, Thin Solid Films, Vol. 228, pp. 87-90
<i>CL</i>	AT	S. Samukawa, "Wave Propagation and Plasma Uniformity in an Electron Cyclotron Resonance Plasma", Sep/Oct 1993, J. Vac. Sci. Technol. A 11(5), pp. 2572-2576

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CL	AA	6,042,700	Gopalraja et al.				
CL	AB	6,051,114	Yao et al.				
CL	AC	6,080,284	Miyaura				
CL	AD	6,106,625	Koai et al.				
CL	AE	6,136,693	Chan et al.				
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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	W.M. Holber, "Copper Deposition by Electron Cyclotron Resonance Plasma", Nov./Dec. 1993, J.Vac.Sci.Technol.A 11(6), pp. 2903-2910
CL	AS	W.D. Getty, "Size-Scalable, 2.45-GHz Electron Cyclotron Resonance Plasma Source Using Permanent Magnets and Waveguide Coupling", Jan/Feb. 1994, J.Vac.Sci.Technol.B 12(1), pp. 408-415
CL	AT	S. Hamaguchi et al., "Simulations of Trench-filling processes Under Ionized Magnetron Sputter Metal Deposition", Mar./Apr. 1995, J.Vac.Sci., Technol.B., Vol. 13, No. 2, pp. 183-191

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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
<i>cl</i>	AR	P.F. Cheng, "Directional Deposition of Cu Into Semiconductor Trench Structures Using Ionized Magnetron Sputtering", Mar./Apri. 1995, J.Vac.Sci.Technol. B 13 (2), pp. 203-208
<i>cl</i>	AS	I.S. Park et al., "A Novel A1-Reflow Process Using Surface Modification by the ECR Plasma Treatment and Its Application to the 256Mbit DRAM", 1994, IEEE, pp. 109-112
<i>cl</i>	AT	S.M. Rossnagel, "Collimated Magnetron Sputter Deposition with grazing Angle Ion Bombardment", Jan./Feb. 1995, J.Vac.Sci.Technol., pp. 156-158

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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
CL	AR	D.S. Garnder et al., "Encapsulated Copper Interconnection Devices Using Sidewall Barriers", 1995, Thin Solid Films, Vol. 262, p. 104-119
CL	AS	Y. Shacham-Diamand, "Electroless Copper Deposition for ULSI", 1995, Thin Solid Films, pp. 93-103
CL	AT	T. Iijima et al., "An Amorphous Ti-Si-N Diffusion Barrier Layer of Cu Interconnections", 1995, Electronics and Communications in Japan, Part 2, vol, 78, No. 12, pp. 67-74
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OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
u	AR	S.M. Rosnagel, "Directional and Preferential Sputtering-Based Physical Vapor Deposition", 1995, Thin Solid Films 263, pp. 1-12
u	AS	T. Yasui et al., "Electron Cyclotron Resonance Plasma Generation Using a Planar Ring-Cusp Magnetic Field and a Reentrant Coaxial Cavity", Jul./Aug. 1995, J. Vac. Sci. Technol. A 13(4), pp. 2105-2109
u	AT	C. Apblett et al., "Silicon Nitride Growth In a High-Density Plasma System", Nov. 1995, Solid State Technology, pp. 73-80

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	AO							
	AP							

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CL	AT	S. Jang et al., "Tantalum and Niobium as a Diffusion Barrier Between Copper and Silicon, 1996, Journal of Materials Science Materials in Electronics 7, pp. 271-278

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U.S. Patent Documents							
*Examiner Initial	Document Number	Issue Date	Name	Class	Subclass	Filing Date If Appropriate	
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	AI						
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Document Number	Date	Country	Class	Subclass	Yes	No		
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u	AS	K. Mikagi, "Barrier Metal Free Copper Damascene Interconnection Technology Using Atmospheric Copper Reflow and Nitrogen Doping in SiOF Film", 1996, IEEE, pp. 365-368
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Foreign Patent Documents

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	AL							
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